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ABSTRACT

This instructional handbook is one of a series of ten packets designed to form a comprehensive course in nutrition for secondary students. The focus of this booklet is on weight reduction diets and, in particular, those diets emphasizing reduced intake of carbohydrates. It contains a page of teaching suggestions, a pre-test for the students, and factual nutrition information with examples of how this information can be used in daily living. A post-test and bibliography are included. (JD)

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NEW HORIZONS IN NUTRITION

AN ISSUE ORIENTED APPROACH

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PROGRAM INTRODUCTION

These ten instructional packets are designed to help you make the science of nutrition a fascinating, relevant topic of study for your students. The study of nutrition is the most basic of all skills as eating is something done by every student every day of his or her life. With the intrinsic relationship between proper nutrition and good health, it is vitally important that we help students to make intelligent decisions with regard to what they eat.

The ten packets which make up New Horizons in Nutrition can be taken together to form a comprehensive course in nutrition for secondary students. If you prefer, individual packets can be used when they're relevant to specific topics in health, home economics, science, or social studies classes. In addition, you can use the materials with entire classes or individual students can be given the packets for self-directed study.

Each packet contains a page of teaching suggestions which can easily be detached before the rest of the booklet is given to the students. The materials for the students include a pre-test, a selection which provides the students with factual information and examples of how this information can be utilized in everyday life, and a post test. Reading the selections and completing the evaluation devices is not enough to insure mastery of the concepts. We urge you to reinforce the packets by following through with related classroom activities. You'll find suggestions in the "Notes to the Teacher" or use them as a springboard to develop activities more ideally suited to the needs of your students. Finally, brief bibliographies are provided with each packet which lists related readings and audiovisual materials.

These suggested materials are not meant to be used as a research bibliography. Rather, they are sources of additional information which are likely to be of interest to secondary students.

The topics of the ten packets are:

1. *Advertising*
2. *Back to Basics*
3. *The Emotional Aspects of Nutrition*
4. *Food Faddism*
5. *Low Carbohydrate Diets*
6. *Nutrition and the Athlete*
7. *Nutrition: Yesterday, Today, and Tommorrow*
8. *Social Issues in Nutrition*
9. *Vegetarianism*
10. *Vitamin C and the Common Cold*

We sincerely hope these packets help you to make nutrition education an alive, relevant, and exciting topic of study for you and your students. The benefits for everyone are well worth your effort.

The Authors

TEACHING NOTES

INTRODUCTION

With the variety of low carbohydrate diets being promoted in the media and their promises of quick and easy weight loss, adolescents are understandably attracted to these weight loss schemes. Yet such diets have the potential to seriously harm the health of the user. By studying these diets, students gain an understanding of the functions and sources of carbohydrate in the diet and develop a perspective on a balanced plan for weight loss.

OBJECTIVES

1. Students will identify the functions and sources of carbohydrate in the diet.
2. Students will list the Basic Four Food Groups and specific foods associated with each group.
3. Students will recall at least three hazards of a low carbohydrate diet.

SUGGESTED ACTIVITIES

1. Collect sample low-carbohydrate diets from books and magazines. Using the Basic Four Food Groups as a criterion, determine if these diets provide a balanced eating pattern.
2. Prepare charts on the Basic Four Food Groups illustrating a comparison of low and high calorie selections from each group (e.g. skim milk vs. whole milk; chicken vs. steak, etc.). It is also important to stress the method of food preparation and accompaniments to the food (e.g. sour cream with a baked potato) can drastically alter caloric content.
3. Snacking is a pitfall for many dieters. In a home economics class, prepare a variety of tasty, nutritious, low calorie snacks.
4. Prepare a series of cartoon-like drawings to illustrate various factors which lead to being overweight.

PRE TEST KEY

1. T
2. F
3. F
4. T
5. F
6. T
7. F
8. T
9. T
10. F

POST TEST KEY

1. T
2. F
3. F
4. F
5. T
6. a)Milk
   b) Meat
   c) Fruit and vegetables
   d) Bread & Cereal
7. a) Metabolism
   b) Activity Level
   c) Eating Habits

TEACHING NOTES CONT'D

POST TEST KEY (CONT'D)

8. a) Supply energy
   b) Protein Sparing
   c) Proper utilization of fat

9. a) Ketosis
   b) Inadequate energy supply to brain
   Others: Irregular heartbeat, fatigue, abnormal blood pressure.

10. Fruits, vegetables, bread and cereal products.

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PRE TEST

TRUE OR FALSE

1. _____ Some people tend to gain weight more easily than others.

2. _____ Skipping meals is a good way to lose weight.

3. _____ Carbohydrates should be reduced or eliminated in the diet if one wants to lose weight.

4. _____ A reduction diet should be planned for you.

5. _____ Ketosis can lead to rapid weight loss.

6. _____ Families have the greatest influence on the formation of our eating habits.

7. _____ The best dietary source of carbohydrate is sugar.

8. _____ The amount of activity we engage in can affect our weight.

9. _____ The utilization of fat depends upon the presence of carbohydrate.

10. _____ The main function of protein in the diet is to supply energy.

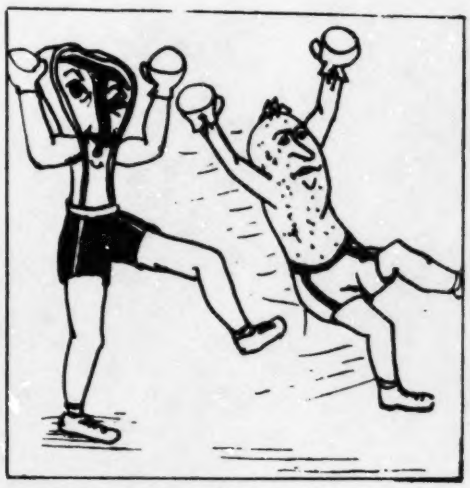
LOW CARBOHYDRATE WEIGHT REDUCTION DIETS

INTRODUCTION

Everyone want to be slender. Everywhere we look, slimness is glorified. Magazines, radio ads, TV ads, newspapers all proclaim the advantages of being slim, and offer advice on ways to attain the desired weight loss. Diet after diet appears. Each one is supposed to be the magic way to shed those unwanted pounds.

As you read through the many diets, you will discover one basic fact. Many of these diets are low in carbohydrate. The diet appears under many different names, Atkin's Diet, the Air Force Diet, the Drinking Man's Diet, and the list goes on. Whatever the name, it is still the same diet, low carbohydrate!

Why do so many diets stress low carbohydrate? This is one of today's fads, just as jeans and disco dancing are fads. But, there is one big difference, the low carbohydrate fad can affect your health. Why is this diet so popular? And, why are we so concerned about overweight?



DO YOU SKIP THE POTATOE AND EAT THE STEAK?

FOOD HABITS AND EFFECT ON WEIGHT

Many people are overweight because they eat more food than they require. Some people are inactive . Still others gain weight easily because of their inherited genes and metabolic system. It is generally felt that carbohydrate is the culprit. Too much carbohydrate results in a weight gain. So. if we eliminate carbohydrate there will be no weight gain. Let us pursue the causes for weight gain and see if carbohydrate is the real villian.

Why do we eat the way we do? We all have our own reasons, and they are many and varied.

Food is a tranquilizer! It is the first tranquilizer we encounter. What was used to bribe us as children, to calm us down, or what was the reward for good behavior? Food! It is deeply ingrained in us, trauma, eat! Stress, eat!

Maybe you were told to clean the plate. Eat everything because children were starving. So, you cleaned the plate, but children continued to starve, and you got used to eating large quantities of food.

Snacking can become a habit. Family meals are sometimes rushed in our fast paced society, so you get used to grabbing food on the run. Possibly you stop at McDonalds or Burger King for that little snack. TV commercials suggest delightful snack foods. So you run to the kitchen, grab your favorite items, and eat your way through the night's TV shows.

Food is related to social events. When we socialize, we eat. You simply have to stop for something to eat after the game, the play, the dance, the concert, etc. Holidays have their own traditional eating patterns, and most families have their own customs.

Maybe you have one meal per day, from morning to night. And all those convenience foods are available and ready to consume.

But the biggest factor in the establishment of eating habits is our family. We tend to eat the way that we learned when we were young. And, these are the habits we carry with us throughout our life.

Our families are also responsible for our genes and our metabolism. These two factors play a part in determining our weight. We inherit our body build and our metabolism from our parents. Some people eat constantly and never gain an ounce. Still others seem to gain weight by just looking at food. We must determine which category we fall into, and adjust our diet accordingly.

Activity also influences weight. If we tend to be inactive, then we do not require large quantities of food. The more active we are, the more food we can eat. So the amount we eat should be adjusted to our activity level.

ESSENTIAL ELEMENTS OF A BALANCED DIET

Whatever our reasons are for eating, we all require the same essential elements daily. These essential elements are called nutrients, and there are six that are needed every day. They are: protein, fat, carbohydrate, vitamins, minerals and water. These nutrients should be supplied by the food we eat, according to our own individual needs. All of the nutrients work together, and one cannot function

correctly without the others. The elimination of any one nutrient can seriously hamper the work of the others.

Carbohydrate, fat and protein supply energy. That is, they give us the fuel to run our body. A certain amount of energy is required by our body every day, and some must be stored for later use. Vitamins and minerals help to regulate the processes of the body that change food into energy.

To ensure the nutritional adequacy of the diet, the Four Food Group Plan is utilized. This plan lists the foods, and the amount of each food that is necessary daily. The Four Food Groups are:

1. The Milk Group (8 ounce cups)
   (3 or more cups for children 9 to 12 yrs.)
   (4 cups or more for teenagers)

   Average Serving:

   1 cup skim milk
   1 cup buttermilk
   1 cup low-fat milk
   1 cup whole milk
   1 cup reconstituted evaporated milk
   1 cup cocoa or chocolate-flavored milk drink
   1 cup malted milk
   1 ounce cheese
   1 1/3 cup cottage cheese
   1 cup yogurt
   1 ½ cup ice cream

The milk group supplies protein, calcium, phosphorous, riboflavin, vitamin A, and vitamin D.

II. The Meat Group or the Protein Group
   (2 servings (5-6 ounces) per day for adults)

   Average Serving:

   2-3 ounces of fish or shellfish
   2-3 ounces of poultry
   2-3 ounces of cooked lean meat
   2 eggs
   2-3 ounces of cheese
   ½ cup cottage cheese
   1 cup dried beans, peas, lentils
   ¾ cup of nuts
   4 tablespoons of peanut butter

This group supplies protein, iron, thiamin, riboflavin, niacin, and fat.

III. The Fruit and Vegetable Group:
   (4 servings per day)

   Include:

   a) One serving of a fruit or vegetable high in ascorbic acid or vitamin C every day.
   b) One serving of a dark green or deep yellow vegetable for vitamin A every other day.

Average Serving:

1 cup raw salads
½ cup cooked fruit or vegetables
1 banana, 1 apple, etc.

Vitamin C Rich Foods

Citrus Fruits:
- oranges or orange juice
- grapefruit or juice
- tangerines
- lemons or juice

Other Fruits and Vegetables:
- cantaloupe
- papaya
- strawberries
- tomatoes or juice
- brussels sprouts
- broccoli
- green peppers

Vitamin A Rich Foods

Deep Yellow:
- carrot
- pumpkin
- sweet potato
- winter squash
- cantaloupe
- apricots

Dark Green:
- collard greens
- kale
- mustard greens
- spinach
- turnip greens

This group supplies ascorbic acid, vitamin A, iron, fiber and other minerals.

IV. The Bread-Cereal Group
(4 servings per day)

All products should be made with whole grain or enriched flour.

Average Serving:

1 slice bread
½ to ¾ cup cooked cereal
1 roll, biscuit, muffin, etc.
1 ounce ready-to-eat cereal
½ to ¾ cup cooked macaroni, spaghetti, noodles, or other pasta

This group supplies the B-complex vitamins, iron, carbohydrates, limited amounts of protein

If these foods are eaten daily in the recommended amounts, then the diet is adequate. All six nutrients are supplied.

ROLE OF CARBOHYDRATE IN THE DIET

Let us take a quick look at the functions of carbohydrate, and then we will see what happens if carbohydrate is eliminated.

1. ***Carbohydrate supplies energy or fuel.*** It is the ideal fuel for most body functions. The body does not have to work hard to digest carbohydrate, so it is readily available. Carbohydrate serves as the source of energy for the brain and the central nervous system. The brain cannot store energy. It needs a minute-to-minute supply, and carbohydrate is ideal because of its availability.

2. ***Carbohydrate is protein-sparing.*** If the body uses carbohydrate for energy then the protein can be saved for building body tissue. If carbohydrate is low, then protein must be used for energy.

3. ***Carbohydrate helps to regulate the utilization of fat in the body.*** When carbohydrate is restricted or eliminated, fat becomes the body's main supply of energy. Fat breaks down faster than the body can take care of the by-products. One of the by-products is ***ketone bodies.*** The body cannot get rid of all these ketones, so they accumulate. The accumulation of ketones leads to ketosis, or piling up of by-products within the body. This is not safe for the body.

4. ***Some carbohydrates have specialized functions:***

   a. Lactose, the sugar found in milk, increases the absorption of calcium (mineral necessary for bones and teeth)

   b. Cellulose supplies fiber to the diet, which aids in the elimination of waste products from the body.

SOURCES OF CARBOHYDRATE

Fruits: apples, bananas, cherries, oranges, peaches, plums, pears, berries, tangerines, grapes, papaya, etc.

Vegetables: potatoes, beans, peas, corn, broccoli, beans, carrots, cauliflower, spinach, lettuce, romaine, asparagus, celery, tomatoes, etc.

Breads-cereals and grain products: bread, muffins, rolls, biscuits, pancakes, waffles, oatmeal, wheatena, cream of wheat, spaghetti, noodles, rice, etc.

FALLACIES AND HAZARDS OF THE LOW CARBOHYDRATE DIET

We gain weight from an excess of any type of food, not just carbohydrate. If we have eaten more food than the body needs for immediate energy or storage, then the excess becomes fat tissue. Excess protein food or excess fat food can be responsible for a weight gain.

When carbohydrate is restricted or eliminated, the brain does not receive energy as quickly as it needs it and the person may black out. Protein is used for energy instead of building body tissue. Also, the body has to work harder to produce energy from protein. It is not a readily available source of energy.

Fat utilization does not proceed smoothly. The body cannot get rid of all of the ketones, so they accumulate in the body. Although keytones do help to supress hunger and carry unused kilocalories,

this does not promote a fast weight loss. The weight loss due to ketosis is approximately a pound every one-two months. So, it is not the magic way to lose those extra pounds.

Low carbohydrate diets can also be hazardous to your health. A low level of carbohydrate lowers the blood level of potassium, causing irregular heartbeats. It causes sodium loss and dehydration; it brings about fatigue and abnormalities in blood pressure. Low carbohydrate can also elevate the cholesterol level of the blood. Another important fact to remember is that a developing fetus can only utilize glucose for energy in the developing nervous system. To deprive it of this fuel, even for a short period of time, can cause irreparable damage.

SUMMARY

If you want to lose weight, do it in a sensible fashion. Check with your doctor to see if it is alright for you to follow a reduction diet. Then follow a diet that is planned for you, one that contains all six nutrient groups in the correct amounts.

DO THESE FOODS DESERVE THEIR FATTENING IMAGE?

WEIGHT GAIN

Perhaps you have the opposite problem. Maybe you are one of those lucky few who want to gain weight! If that is the case then you should increase the amount of food that you eat every day. Start with the Basic Four Food Groups and then add other foods accordingly. You may increase the number of servings in each group, and that will increase the nutritive value of your diet. Then add other foods

to meet your caloric requirement, such as salad dressings, butter, margarine, jams, jellies, desserts, etc. Snacks are one way to increase your caloric intake, but make sure that they are nutrients. Try milk shakes, custards, puddings, ice cream, cheese, sandwiches, etc. If you eat 500 extra calories each day for one week then you will gain a pound. Many people wish that they had this problem.

CASE STUDY

HELP WITH A "HEAVY" PROBLEM

Courtney is sixteen and miserable. She had looked forward to her junior year in high school with great excitement - this would be the year of getting her driver's license and her first formal prom. But nothing had worked out as she expected.

Sure, thanks to driver's ed training at school she had been successful in getting her long-coveted license. Now she faces one battle after another with her parents over the use of the family car. Other than quick trips to the neighborhood store for her mother and picking up her younger brother after Little League practice, her parents rarely allowed her to use the car. Many times after a tearful argument over the car, Courtney found herself in the kitchen concocting a super hot fudge sundae or devouring a big piece of chocolate cake. And that only made her other problem worse.

Courtney needed to lose weight and she knew it. According to the height/weight chart in the nurse's office at school, she should weigh 115 pounds; while the last time she had the courage to check the bathroom scale, it had read an ominous 133 pounds. The junior prom was fast approaching and so far no one had invited Courtney. She wanted to find a diet to lose weight and lose it quickly. Sure she had heard in Health and Home Economics classes that no one should attempt to lose more than two pounds per week without a doctor's supervision, but that wouldn't help with the prom only five weeks away.

In a local bookstore, Courtney found what she thought was the answer to her prayers. A bestseller written by a doctor guaranteed an easy way to drop pounds easily and quickly without counting calories. At home that night Courtney poured over the book and found the "rules" of the diet to be very simple indeed:

1. No fruits, vegetables, breads, cereal, or grain products are to be eaten.
2. No milk is allowed.
3. No sugar or concentrated sweets are permitted.
4. All the meat, fish, poultry and eggs one desires may be eaten without concern for portion size.
5. The dieter must drink at least eight glasses of water a day.

QUESTIONS

1. Use the Basic Four Food Groups to determine if the above diet plan is likely to meet Courtney's nutritional needs. What specific nutrients are likely to be deficient?

2. What physical effects might Courtney expect to experience from following such a diet?

3. The diet given in the case study is obviously very low in carbohydrate. However the foods permitted in the diet are high in two of the essential nutrients. Use reference materials in your classroom or library to find out how many calories per gram are supplied by those two nutrients. Do the same thing for carbohydrate and compare.

4. What factors may have played a role in Courtney's becoming over-weight? Offer concrete suggestions for modifying some of those contributing factors.

5. Is Courtney likely to follow the diet given in the case study for any length of time? Explain your answer.

6. Name at least three sources of reliable advice concerning weight loss diets that you should suggest to Courtney.

POST TEST

TRUE OR FALSE

1. _____ The brain needs glucose for energy.
2. _____ Low carbohydrate diets are safe and will not affect your health.
3. _____ Ketosis can lead to rapid weight loss.
4. _____ Protein is a readily available source of energy.
5. _____ The utilization of fat depends upon the presence of carbohydrate.
6. The Four Food Groups are:
   a.
   b.
   c.
   d.
7. Three factors that can affect our weight are:
   a.
   b.
   c.
8. Three functions of carbohydrate are:
   a.
   b.
   c.
9. Two effects of low carbohydrate diets are:
   a.
   b.
10. List some of the food sources of carbohydrate: